

REMARKS

In the Office Action, the Examiner indicates that claim 23 includes allowable subject matter and would be allowed if rewritten in independent form and the rejection under 35 U.S.C. §112, second paragraph, is overcome. The specification is objected to under 37 C.F.R. §1.71(a) for not containing a full written description of the invention. The drawings are objected to under 37 C.F.R. §1.83(a) for not showing every feature of the invention specified in the claims. Claims 20-23, 26, and 28 are objected to for having informalities. Claims 22, 23, 26, 28, and 29 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 17-21 and 24-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,798,622 to Hirai et al. ("Hirai") in view of U.S. Patent No. 6,934,167 to Jang et al. ("Jang") and U.S. Patent No. 6,231,013 to Jaenker ("Jaenker"). Claims 22, 28, and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai in view of Jang and Jaenker and further in view of JP 07-046864 to Kurakawa et al. ("Kurakawa").

In this response, claims 17, 19, 20-23, 25, 26, 28, and 29 have been amended. Claim 24 has been cancelled without prejudice or disclaimer of the subject matter recited therein. No new matter has been added. Claims 17-23 and 25-29 are now pending.

Reconsideration of the application in view of the above amendments and following remarks is respectfully requested.

Indication of Allowable Subject Matter in claim 23:

Applicants would like to thank the Examiner for the indication that claim 23 contains allowable subject matter and would be allowed if rewritten in independent form and the rejection under 35 U.S.C. §112, second paragraph, is overcome. However, in view of the following remarks, it is respectfully submitted that all of the pending claims are in condition for allowance.

Objection to the Specification:

The specification is objected to under 37 C.F.R. §1.71(a) for not containing a full written description of the invention. Specifically, the Examiner notes that a "shift lat device" recited in claim 23 is not disclosed in the specification. Claim 23 has been amended to correct a

typographical error and recite a “shift lag device.” Support for this amendment may be found, for example, in Paragraph [0017] of the originally filed specification. No new matter has been added.

Withdrawal of the objection to the specification under 37 C.F.R. §1.71(a) is respectfully requested.

Objection to the Drawings:

The drawings are objected to under 37 C.F.R. §1.83(a) for failing to show every feature of the invention specified in the claims. Specifically, the Examiner notes that a “shift lat device” recited in claim 23 is not shown in the drawings. As noted above, claim 23 has been amended to correct a typographical error and recite a “shift lag device.” No new matter has been added.

Withdrawal of the objection to the drawings under 37 C.F.R. §1.83(a) is respectfully requested.

Objections to claims 20-23, 26, and 28:

Claims 20-23, 26, and 28 are objected to for having various informalities. In response, claims 20-22, 26, and 28 have been amended to address the objections. No new matter has been added. With respect to claim 23, Applicants respectfully submit that the terms “the switching grid signals” (lines 7-8) and “the switch pair” (line 12) are introduced with proper antecedent basis in line 4 as “switching grid signals,” and in line 10 as “a switch pair.” Further, Applicants are uncertain as to the “multiple switch pairs” to which the Examiner refers. See August 11, 2008 Office Action, p. 3.

Withdrawal of the objections to claims 20-23, 26, and 28 is respectfully requested.

Rejections to claims 17-22 and 24-29 under 35 U.S.C. §112:

Claims 22, 23, 26, 28, and 29 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, claims 22, 23, 26, 28, and 29 have been amended to address the rejections.

Withdrawal of the rejections to claims 22, 23, 26, 28, and 29 under 35 U.S.C. §112 is respectfully requested.

Rejections to claims 17-22 and 24-27 under 35 U.S.C. §103(a):

Claims 17-22 and 24-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai in view of Jang and Jaenker.

Hirai describes a noncontacting transfer apparatus for transferring power and control signals to a load in a mobile or rotatable unit. The apparatus includes a split-type transformer, a rectifier and a smoothing circuit. Hirai describes implementations of the apparatus to include machine tools and robots.

Jang describes a contactless electrical energy transmission system. The described system couples a power source to a load through a transformer and a resonant circuit of a rectifier. Jang mentions underwater and mining applications as possible uses of contactless electrical energy transmission systems ("CEETS") in describing the background of CEETS.

Jaenker describes an airfoil member with piezoelectric stack actuators. The piezoelectric actuators described by Jaenker actuate flaps located on an edge of the airfoil member. However, Jaenker does not describe any electrical systems that provide power or control signals to the actuators.

Amended independent claim 17 recites a device for contactless electrical power transmission wherein "at least portions of the inductive transformer, frequency generator and at least one actuator control element are configured to be disposed in an area of a rotor shaft and a rotor head of a rotary-wing aircraft." Support for this amendment may be found, for example, in Paragraphs [0076] and [0077] and Figure 9 of the Specification. It is respectfully submitted that Hirai, Jang and Jaenker, alone or in combination, do not teach or suggest at least this feature of the presently claimed invention.

Hirai describes a noncontacting transfer apparatus for use in machine tools and robots and Jang describes a contactless energy transmission solution. The Examiner concedes that neither Hirai nor Jang describe a rotary wing aircraft, and attempts to cure this deficiency with

Jaenker. The Examiner further asserts that the recitation of a rotary-wing aircraft is “an intended use recitation which is not given patentable weight.” Applicants respectfully disagree.

Amended independent claim 17 recites a device for contactless electrical power transmission in a rotary-wing aircraft system having:

an inductive transformer including a primary winding disposed on the stationary portion of the rotor shaft bearing of the rotary-wing aircraft and a secondary winding disposed on the rotor shaft of the rotary-wing aircraft, the inductive transformer bridging an isolating point between the stationary portion of the rotor shaft bearing of the rotary-wing aircraft and the rotor shaft of the rotary-wing aircraft...[and] at least portions of the inductive transformer, frequency generator and at least one actuator control element disposed in an area of a rotor shaft and a rotor head of a rotary-wing aircraft.

Thus, independent claim 17 is directed to a rotary-wing aircraft contactless electrical power transmission system. These limitations recited in amended claim 17 are structural features, and are not mere intended uses. These recitations “cover what [the] device *is*, [and] not what [the] device *does*.” MPEP §2114 (*quoting Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469 (Fed. Cir. 1990)) (emphasis in original). Accordingly, the recitation of limitations regarding a rotary-wing aircraft should be afforded patentable weight.

In addition to failing to teach or suggest all of the elements of claim 17, Applicants further submit that the combination of the references in the specific manner urged by the Examiner is improper.

Hirai describes a noncontacting transfer apparatus that powers a motor 364₄. Specifically, the “motor 364₄ provided on the separable mobile side can be either a direct current motor or an alternating current motor, and ***should be understood as a torque generator***” (emphasis added). *See* Hirai, col. 25, lines 57-60. Thus, the noncontacting transfer apparatus of Hirai powers an electric motor generating a rotational force. However, Jaenker describes a servo-flap actuated via piezoelectric actuators. Piezoelectric materials generally exhibit linear deformation in response to precise voltages. *See* Jaenker, col. 5, lines 53-56. A circuit powering a “torque generator” motor is incompatible with providing “appropriate actuating voltage[s]” as necessitated by the piezoelectric actuators of Jaenker. *See id.*

Accordingly, for at least the reasons described above, withdrawal of the rejections to independent claim 17, and dependent claims 18-22 and 24-27 under 35 U.S.C. §103(a) is respectfully requested.

Rejection to claim 22 under 35 U.S.C. §103(a):

Claim 22 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai in view of Jang, Jaenker and Kurakawa.

Kurakawa describes a driver for a piezoelectric actuator for a precision microscope. The device describes a driver that is isolated from the load via a photocoupler. Further, the system measures error and controls the actuator through charging and discharging of the actuator.

Claim 22 depends from claim 17, and Kurakawa does not cure the deficiencies of Hirai, Jang, and Jaenker. Accordingly, Applicants respectfully submit that Hirai, Jang, Jaenker, and Kurakawa do not render claim 22 obvious for at least the reasons discussed above.

Withdrawal of the rejection to claim 22 under 35 U.S.C. §103(a) is respectfully requested.

Rejections to claims 28 and 29 under 35 U.S.C. §103(a):

Claims 28 and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirai in view of Jang, Jaenker and Kurakawa.

Independent claim 28 recites a method for providing power to a capacitive actuator, comprising the step of “generating a high-frequency alternating current from a direct voltage using a frequency generator disposed in the stationary system, the high-frequency alternating current having an amplitude independent of a phase angle and of an amplitude of a reverse voltage.” This is performed, for example, by matching the generator frequency with the resonant frequency of the series-resonant circuit. *See* Specification, ¶[0051]. It is respectfully submitted that Hirai, Jang, Jaenker, and Kurakawa, alone or in combination, do not teach or suggest at least this feature of the presently claimed invention.

The Examiner concedes that Hirai does not expressly describe this feature, but asserts that Hirai inherently discloses this feature because “Hirai does not disclose or suggest that the

higher-frequency AC current amplitude is dependent on a phase angle and amplitude of a reverse voltage.” *See* August 11, 2008 Office Action, p. 11. Applicants respectfully disagree.

In order to establish inherency, the Examiner must show that the feature not expressly disclosed by the reference is necessarily present. *See* MPEP §2112. As described in the specification, generation of a high-frequency alternating current having an amplitude independent of a phase angle and of an amplitude of a reverse voltage enables the frequency generator to “not only deliver active power and reactive power to the moving secondary part via the transformer 3, but can also pick up active power from said moving secondary part and can supply the picked-up active power to the direct voltage source U_B .” *See* Specification, ¶[0042]. Hirai’s silence regarding this feature and its associated functionality does not indicate that a “high-frequency alternating current having an amplitude independent of a phase angle and of an amplitude of a reverse voltage,” as recited in claim 28, is *necessarily present* in the system described by Hirai. Accordingly, this limitation cannot be inherent in Hirai’s disclosure.

Withdrawal of the rejection to claim 28 under 35 U.S.C. §103(a) is respectfully requested.

Independent claim 29 recites features similar to those discussed above with respect to claim 28. Thus, it is respectfully submitted that for at least the reasons discussed above, Hirai, Jang, Jaenker, and Kurakawa do not render claim 29 obvious.

Withdrawal of the rejection to claim 29 under 35 U.S.C. §103(a) is respectfully requested.

CONCLUSION

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

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